

PREPARATION AND APPLICATION OF NATURAL ZEOLITE/ZnO MATERIAL AND ITS APPLICATION ON THE PHOTODEGRADATION OF CONGO RED AND RHODAMINE B UNDER ULTRAVIOLET IRRADIATION

by M. Pranjoto Utomo, Kun Sri Budiasih, Anti Kolonial Prodjosantoso, Isti Yunita, Tisia Miftakhul Triani, Vera Dwi Nur Rahmawati, Debrina Galuh Praswari, Muhammad Jauharul Lathif Ramadhan, Iqbal Rahmandito

ABSTRACT

This research aims to study the preparation characterization and applications of natural zeolite/ZnO material on the photodegradation of congo red and rhodamine B under ultraviolet irradiation.

Preparation of natural zeolite/ZnO material conducted by precipitation method. Activated zeolite was mixed by $\text{Zn}(\text{CH}_3\text{COO})_2 \cdot 2\text{H}_2\text{O}$ and ethanol, and then stirred, heated and added by NaOH. The resulting precipitate was dried and calcined in muffle furnace. Natural zeolite/ZnO material was characterized by using XRD, FTIR, UV-Vis and SEM-EDX. Application of natural zeolite/ZnO material was tested by photocatalysis activity in the photodegradation process of congo red and rhodamine B.

Natural zeolite/ZnO material was successfully synthesized by precipitation method with crystal size was 24.26 nm and showed wavelength number of ZnO at 451.79 cm^{-1} dan 519.20 cm^{-1} . Band gap energy of natural zeolite/ZnO material was 2.96 eV. The crystal size of ZnO and natural zeolite were $0.313 - 0.370 \mu\text{m}$ and $0.384 - 1.076 \mu\text{m}$ respectively. Activity test of natural zeolite/ZnO material on the photodegradation of congo red and rhodamine B resulted the photodegradation percentage 99,41 % and 99,54% respectively.

Kata Kunci: *natural zeolite/ZnO, photodegradation, congo red and rhodamine B*